SUPPLEMENTAL DIRECT TESTIMONY

OF

BUD GREEN

TELECOM ENGINEERING PROGTRAM

SAFETY AND RELIABILITY DIVISION

ILLINOIS COMMERCE COMMISSION

NTS SERVICES CORP.

v.

GALLATIN RIVER COMMUNICATIONS L.L.C. D/B/A CENTURYLINK

DOCKET NO. 12-0116

JULY 12, 2013

Q. Please state your name and business address.

A. My name is Bud Green and my business address is 527 East Capitol Avenue, Springfield, Illinois 62701.

Q. By whom are you employed and in what capacity?

A. I am employed by the Illinois Commerce Commission as the Chief Engineer in the Telecom Engineering Program in the Safety and Reliability Division.

Q. Please briefly describe your work duties with the Illinois Commerce Commission.

A. My responsibilities include supervising and directing the activities of the Telecomm Engineering Program of the Illinois Commerce Commission's Safety and Reliability Division. These activities include certification cases, formal complaint cases, and various telecommunications industry related cases where engineering is warranted. I also plan, coordinate, and participate in telecommunications cases, provide expert testimony, and recommend Staff and Commission action within those proceedings. Finally, I furnish technical assistance on telecommunication matters for projects, studies, reports and research.

Q. Please state your educational background and work experience.

A. I am a Professional Engineer licensed in the State of Illinois (License No. 062035130). I graduated from the University of Illinois with a Bachelor of Science Degree in Engineering in 1970. After graduation, I joined Illinois Bell Telephone Company as an Engineer in its Engineering Department. While with Illinois Bell for 14 years I held the following positions: Engineer, Systems Analyst, Network

Forecasting Engineer, Communications Systems Representative, Account Executive and Account Manager.

At divestiture in 1984, I transferred to AT&T as an Account Manager. In 1987, I joined Tele-Sav Inc, an inter-exchange carrier and held the following positions: IXC Traffic Trader, District Sales Manager and Director of Strategic Planning. As the Director of Strategic Planning I was responsible for the overall intermediate to long range planning for the IXC.

When Tele-Sav was sold to Telecom USA in July 1989, I returned to AT&T. Subsequent to my return to AT&T, I held the positions of Data Networking Account Executive, Sales Manager, and Building Engineer. In October 1998, I became the Vice President of a consulting engineering firm, KM2 Design Group, P.C. I joined the Illinois Commerce Commission in June 2000, as the Chief Telecommunications Engineer.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is primarily to respond to a request for information presented by Judge VonQualen at the hearing on June 5, 2013 in which she was seeking information regarding testing on the AC power to see if in fact it is still on the generator.

Q. Are there other matters which you feel should be addressed in order to help with the overall understanding of this situation?

A. Yes. I will attempt to provide an overall outline of the power provisions within a central office and the Commission's standards of service in an effort to help bring some clarity to this issue.

Q. Is Gallatin River Communications LLC d/b/a CenturyLink (CenturyLink) subject to standards of service as imposed by the Illinois Commerce Commission?

A. Yes. CenturyLink is an electing carrier under Section 13-506.2 of the Public Utilities Act and is therefore subject to 83 Ill. Adm. Code Part 737, Standards of Service and Customer Credits for Electing Carriers.

Q. Please explain these standards of service as they pertain to generators located within central office facilities.

A. Code Part 737.410, Emergency Operation, sets forth requirements, in part, for the maintenance of batteries as well as generators including the minimum amount of fuel supply for the generator and minimum testing requirements.

Q. What is the minimum testing requirement for the generators under Part 737.410?

A. The minimum testing requirement is that the generators be tested, under load, at least once per month.

Q. Would the Commission object to more frequent testing of the generator?

A. No.

Q. Is there a requirement that the generator be tested during off-peak hours?

A. No.

Q. Is there a valid reason for testing of the generators during regular business hours?

A. Yes. Many of the central offices are located in areas that contain residential dwellings. The generators are extremely noisy when running, so many companies avoid running the generators during hours when people would normally be sleeping. Additionally, it is imperative that the testing take place

during hours when company personnel are on-site, which is most often during regular business hours.

Q. What is the primary purpose of the generator?

A. The primary purpose of the generator at most central offices is to function in the absence of commercial alternating current ("AC") power in order to keep the rectifiers running, which in turn charge large strings of stationary batteries located in the central offices. The vast majority of telecommunications equipment is designed to operate with direct current ("DC") power, which is provided by those stationary batteries. The batteries are designed to hold power to the central office for a period of three to five hours without being recharged. Because the central office equipment functions primarily off DC power, the loss of commercial AC and the switchover to the generator generally does not cause any interruption in service. However, I cannot confirm whether NTS's equipment is designed to operate with DC power as most systems are designed or with AC power, as some systems utilize.

Q. Does the generator provide any other purpose?

A. Yes. The electrical systems in the building may or may not be wired so that they are also protected by generator power should the central office loose commercial AC power. The generator is often sized sufficiently to handle all the load of central office building including all lights, power outlets, air conditioning and heating equipment, etc. In some instances, the load that is switched to the generator in case of commercial AC power outages may be limited if the generator does not have the capacity to carry the entire load.

Q. Are you personally aware of the generator situation in the Pekin central office?

A. Yes. On December 9, 2010, and again on April 7, 2011, Commission staff conducted visits to CenturyLink's Pekin central office.

Q. What were the results of those visits?

A. A full central office inspection was conducted on April 7, 2011, and the report prepared by Staff indicated that there were two separate generators on site at that time. The main generator that carried the load of the central office equipment was located in the basement of the building and was in the process of being replaced and updated.

Q. Has Staff returned to the central office since April of 2011?

A. No.

Q. At the time of the inspection, did Staff ascertain that generator testing was being conducted in accordance with the standards of service?

A. Yes.

Q. As part of a routine central office inspection, does Staff determine what AC equipment is covered by the generator?

A. No. As indicated earlier in my testimony, the primary purpose of the generator is most often to maintain power to the string of batteries should commercial power be lost.

Q. Is there a momentary AC power outage when commercial power is terminated and the generator starts?

A. Yes.

Q. If there is a critical piece of equipment in the central office that functions off of AC power, what happens during the outage?

A. If there is a critical piece of equipment in the office that is powered by AC power, it is generally equipped with an uninterruptable power source ("UPS") system.

Q. What is a UPS system?

A. UPS systems are battery back-up systems that will allow AC equipment to either continue functioning until a generator comes on line or allow the equipment time to power down in a controlled manner.

Q. Are UPS systems required or regulated by the Commission's standards of service?

A. No.

Q. Is it your understanding that NTS Services Corporation ("NTS") utilizes a UPS system for their equipment?

A. Yes.

Q. Do you have any knowledge of any testing that may have been conducted to ascertain if NTS's UPS system is functioning appropriately?

A. No.

Q. Even though it is not required by Code Part 737 or any other Commission rule, is there a way to test the AC power connections for NTS's equipment to determine if it is connected to the on-site generator?

A. Yes. The straight forward method would be to observe the functioning of the NTS equipment at the time the generator is tested. Also it would not be difficult to use

a simple volt meter or other such device that would indicate the presence of power to the equipment.

Q. Would this resolve the question as to whether or not NTS is receiving back-up power from the generator?

A. Yes.

Q. Is there another explanation for loss of power to the NTS equipment?

A. Yes. There is a possibility that there is a problem with the NTS UPS system.

Q. To your knowledge, have any tests been conducted to date on the AC power?

A. I have no knowledge on the testing of the AC power, since that is not a requirement mandated by this Commission.

Q. Do you have a recommendation regarding the testing of electrical power to NTS?

A. Yes, I suggest that the operation of the NTS equipment be observed by both NTS and Gallatin River during a scheduled testing of the Gallatin River generator.

Q. Would an ICC engineering staff member to be present when the power is tested?

A. Yes, a staff member could be present should either NTS or Gallatin River request it.

Q. Does this conclude your testimony?

A. Yes.